

First record of *Cacyreus marshalli* in Greece, and comments on the potential occurrence of *Zizeeria karsandra* on the Greek island of Crete (Lepidoptera: Lycaenidae)

Hristos T. Anastassiou, Nikos Ghavalas & John G. Coutsis

Abstract. A thriving colony of *Cacyreus marshalli* (Butler, 1898) is reported for the first time from Greece. The butterflies appeared in large numbers in late summer and throughout autumn of 2009 in parkland and gardens in the northern suburbs of Athens. Introduced *Pelargonium* plants in a particular park were identified as the most probable explanation of this sudden occurrence. Moreover, the authors' persistent, yet unsuccessful efforts to locate *Zizeeria karsandra* (Moore, 1865) on the island of Crete are discussed.

Samenvatting. Eerste vermelding van *Cacyreus marshalli* in Griekenland, en bemerkingen over het mogelijke voorkomen van *Zizeeria karsandra* op het Griekse eiland Kreta (Lepidoptera: Lycaenidae)

Een succesvolle kolonie *Cacyreus marshalli* (Butler, 1898) wordt voor het eerst uit Griekenland vermeld. De vlinders vlogen talrijk in de nazomer en de herfst van 2009 in parken en tuinen van de noordelijke buitenwijken van Athene. De meest waarschijnlijke oorzaak van dit plotse voorkomen zijn de talrijke *Pelargonium* planten in een van deze parken. Verder worden de doorgedreven, maar tot nu toe onsuccesvolle, pogingen besproken om het voorkomen van *Zizeeria karsandra* (Moore, 1865) op Kreta te bevestigen.

Résumé. Première mention de *Cacyreus marshalli* en Grèce, et remarques sur la présence éventuelle de *Zizeeria karsandra* en Crète (Lepidoptera: Lycaenidae)

Une colonie florissante de *Cacyreus marshalli* (Butler, 1898) est mentionnée pour la première fois en Grèce. Les papillons volaient en grand nombre pendant la fin de l'été et l'automne de 2009 dans des parcs et jardins des quartiers septentrionaux d'Athènes. La raison de cette explosion est probablement la plantation des *Pelargonium* dans un parc particulier. Les efforts persistants, mais jusqu'à présent effectués sans succès, pour localiser *Zizeeria karsandra* (Moore, 1865) sur l'île de Crète, sont également discutés.

Key words: Lycaenidae – *Cacyreus marshalli* – Greece – Athens – *Pelargonium* – *Zizeeria karsandra* – Crete.

Anastassiou, H. T.: 12 Periandrou Str., GR-15126 Athens (Maroussi), Greece. hristosa@esd.ece.ntua.gr

Ghavalas, N.: 30 Karaoli-Dimitriou Str., GR-12461 Athens (Haidári), Greece. vale98@otenet.gr

Coutsis, J. G.: 4 Glykonos Street, GR-10675 Athens, Greece. kouts@otenet.gr

Introduction

The South African Lycaenid butterfly *Cacyreus marshalli* (Butler, 1898) was accidentally introduced to the Balearic Islands in 1987 (Eitschberger & Stamer 1990, Raynor 1990, Myncke 1991, Grey 1992, Sarto i Monteys & Maso 1992, Maso 1994, Tolman & Lewington 1997). Since then, it gradually extended its range, occurring in several areas of continental Spain (Latasa-Asso 1993, Redondo & Murria 1993, Cervello 1995, Ortiz-García 1995, Dantart 1996, Lalanne-Cassou 1996, Stefanescu 1996, Torres-Villa & Bielza 1997, Crawforth 1998, Fernandez *et al.* 1998, Reinhardt 1999, Oliver-Sanz 2000, Suarez-Fernandez 2003), in the Canary Islands (Fernandez 2003, Acosta-Fernandez 2004 & 2005, Hornemann 2004, Tennent *et al.* 2004), in continental Portugal,

(TARRIER 1998, White 1998, Dunkin 2005), in Madeira (Wakeham-Dawson & Aguiar 2003), in Morocco (TARRIER 1998), in various areas of continental France (Reid 1998, TARRIER 1998, Billi *et al.* 1999, Maechler 2000, Pasquir 2000, Quivron 2000, Savina 2001, Adge 2002, Marney 2002, Girod & Sauce 2002, Mérit & Mérit 2002, Mérit 2003, White 2004, Binon 2005, Mace 2007), in Corsica (Shaw 2001, Landemaine 2002), in continental Italy (Trematerra *et al.* 1997, Lang 2002, Casini 2003, Russo 2003, Tropinao 2003, White 2004, Aistleitner & Pollini 2004, Dapport 2004, Favilli & Manganelli 2006), in Sicily (Cernigliaro *et al.* 2003), in Sardinia (Contini *et al.* 2005), in Switzerland (Aistleitner 2003, Aistleitner & Pollini 2004), in Germany (Gries 2000, Thiele & Nassig 2000, Filus *et al.* 2001) and in Malta (Sammut 2007). Isolated specimens have also been recorded from further north, in countries such as Belgium (Troukens 1991, Heylen *et al.* 2002, Cuvelier *et al.* 2009), Sweden (Ryrholm 2007), and unofficially the UK (Eeles 2009). Very recently the species was recorded from Slovenia (Polak 2009) and from Mali Lošinj, an Adriatic island of Croatia (Kosmač & Verovnik 2009).

First record from Greece

Given the obvious tendency of the species to expand its range eastwards, the authors have been monitoring the western coast of Greece over the past few years, but no traces of the butterfly were seen in that area. According to Pamperis, pictures of the butterfly were taken by him on the island of Kérkira (Corfu) in August 2009, but this record requires confirmation through collected specimens (Pamperis 2009). Finally, on August 14, 2009, the first author spotted and captured a worn male, sitting on *Ocinum americanum* Linnaeus (sweet basil), on the sidewalk of a very busy street, in the Athens suburb of Maroussi, more than a mile away from any major parkland. A second male was captured on September 2, fluttering around a cedar tree, in a small park in the same suburb. On October 2–4, 2009, and after a month of no records, possibly because the search for the butterfly was carried out in the wrong places, more than 30 specimens were collected in several northern suburbs of Athens, namely Maroussi, Kifissia and Néa Erithrea. Most males were worn, and found scattered over a large area that includes gardens and other open spaces, where they were observed feeding on various kinds of flowers, especially *Heliotropium hirsutissimum* Grauer. The only significant concentration of females, which were usually fresh, was found at a circular, three meters in diameter flower bed, full of *Pelargonium* plants, inside the Singrou parkland in Kifissia.

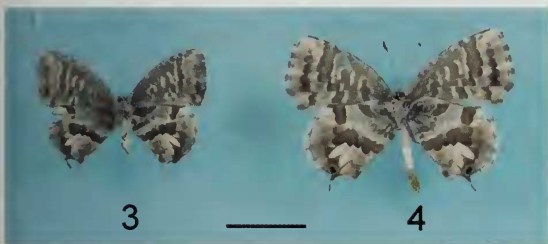
Discussion on the origin of the Athens specimens and their viability

Interviewing the local gardener revealed that the particular *Pelargonium* plants had been planted within 2009, replacing older ones that had been damaged by frost last winter. The gardener insisted that the plants had not been imported from abroad, however the reliability of his claims is in question. Given that no specimens have been officially recorded between Athens and the closest

hitherto known location of occurrence, i.e. Mali Lošinj, it is very unlikely that the species has arrived from Croatia through the Balkans. It is much more probable that it was accidentally introduced through imported *Pelargonium* transplants, as originally was the case in the Balearic Islands.



Figs. 1–2. *Cacyreus marshalli*, Greece, upperside. 1.–♂, Athens, Maroússi, 300 m, 20.xii.2009; 2.–♀, Athens, Maroússi, 300 m, 30.xii.2009. Scale bar: 1 cm.



Figs. 3–4. *Cacyreus marshalli*, Greece, underside. 1.–♂, Athens, Maroússi, 300 m, 20.xii.2009; 2.–♀, Athens, Maroússi, 300 m, 30.xii.2009. Scale bar: 1 cm.

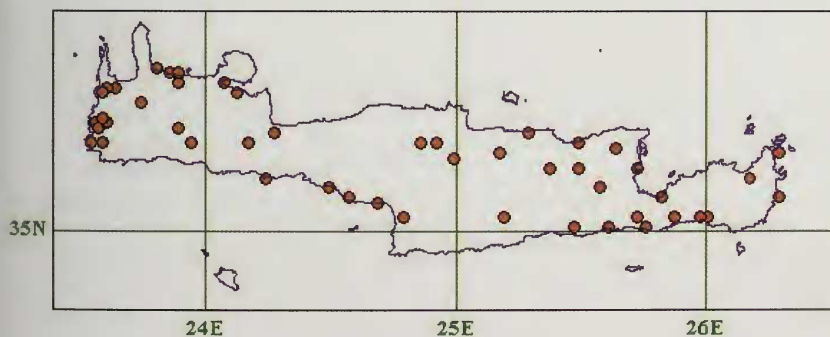


Fig. 5. Locations on Crete visited in search of *Zizeeria karsandra*.

Several specimens were frequently seen in the northern suburbs of Athens throughout October and, more scarcely, in November and December (Figs.1, 2). One specimen was also recorded on *Pelargonium* plants in an urban area much closer to downtown Athens (suburb of Galátsi). The latest record in 2009 comprised a fresh female specimen on *Pelargonium* plants in Maroussi on December 30, an unusually warm day after a month of alternate warm and cold weather periods, implying that the species is quite resilient to rough conditions. Also, two caterpillars were collected and kept indoors on a pile of *Pelargonium* leaves. They soon pupated and the butterflies emerged in late January 2010.

The climate in Athens, and generally in Greece, though generally mild, may occasionally be quite severe, often subjecting the country to lasting subzero temperatures and plenty of snow. Given these adverse conditions it remains to be seen whether or not this butterfly will be able to establish itself in Greece on a permanent basis, as it has already done in SW Europe.

The possibility of occurrence of *Zizeeria karsandra* (Moore, 1865) on Crete

According to Hesselbarth *et al.* (1995), Tolman & Lewington (1997) and Makris (2003), *Z. karsandra* is widespread in E. Algeria, Tunisia, N. Libya, Malta, Turkey and Cyprus, and probably occurs also on the Greek islands of Crete and Rhodes. The original record for Crete was made by Beuret (1955), who examined one male and one female specimen, both belonging to Hans Reisser. The female was purportedly captured at "Listouvounos" and the male at "Palialimata" (Pílalímata), both located in southern Crete. Pamperis (1997) presents several pictures of the species in his book, and claims that they were taken in Crete, but avoids disclosing the exact location on the basis of his controversial attitude towards ecological protection. Recently, a highly surprising, anonymous, unofficial record (again, without collected specimens) has been added to the lot from the southern Aegean island of Mílos, where, however, the dry environment is completely incompatible with the usual, humid habitat of *Z. karsandra* (see Bonetti 2008).

The authors have tried to spot this butterfly on Crete in dozens of trips, from early spring to late autumn, over several years. In the end of September 2009, i.e. the most favourable time of the year for this species, the first author devoted a trip solely to this butterfly, driving about 1100 km in the eastern three quarters of the island and checking almost all suitable, accessible habitats (mostly rivers and dry river beds), all to no avail. The locations visited by the three authors over the past years, in addition to places visited by other entomologists known to the authors, are depicted in Fig. 5. Areas not covered in the map are either mountainous or densely urbanized, and therefore not suitable for *Z. karsandra* habitat. It is obvious that the island has been scanned thoroughly, and the fact that the species has been encountered by nobody else except Pamperis is puzzling. Its apparently extreme rarity is baffling indeed, since all known

colonies of the species within its range, including the island of Cyprus (Makris 2003), are richly populated.

If the butterfly indeed occurred on Crete, it is reasonable to assume that it should also be expected to occur in SW Turkey, to ensure some minimum distribution continuity for a typically lowland species, such as *Z. karsandra*. However, in Hesselbarth *et al.* (1995) the following localities are given for Turkey: Provinces of Adana, Gaziantep, Hatay, Diyarbakır and İçel. All are in the east of Anatolia and most are along the Mediterranean coast across from Cyprus. Not a single record from more western localities, i.e. from those that are closer to Greece. All of this means that the existence of this species in Greece is highly improbable, and that, perhaps, the Beuret record from Crete was based on mislabeled specimens.

References

- Acosta-Fernandez B. 2004. Geranium bronze *Cacyreus marshalli* (Butler, 1898) (Lep.: Lycaenidae) and other interesting butterflies on Fuerteventura, Canary Islands. — *Entomologist's Record and Journal of Variation* **116**(6): 258.
- Acosta-Fernandez B. 2005. *Cacyreus marshalli* Butler, (1898) en Fuerteventura y Gran Canaria (Islas Canarias, Espana) (Lepidoptera: Lycaenidae). — *SHILAP Revista de Lepidopterologia* **33** (131): 245–246.
- Adge, M. 2002. Nouvelles observations de *Cacyreus marshalli* Butler dans l'Herault (Lepidoptera Lycaenidae). — *Alexanor* **21**(5): 295–297.
- Aistleitner, U. 2003. Erste Nachweise des Geranien-Blaeulings *Cacyreus marshalli* Butler, 1898, in der Schweiz (Lepidoptera: Lycaenidae). — *Entomologische Berichte Luzern* **49**: 151–154.
- Aistleitner, U. & Pollini, M. 2004. Weitere Meldungen von *Cacyreus marshalli* Butler, 1898, aus der Südschweiz und Oberitalien (Lepidoptera: Lycaenidae). — *Entomologische Berichte Luzern* **52**: 153–154.
- Bonetti, A. 2008. — www.kykladesnews.gr/milos/68-newscategory/50635-2010-01-29%2005-40-17.html
- Beuret, H. 1955. *Zizeeria karsandra* Moore in Europa und die systematische Stellung der Zizeeriinae (Lepidoptera, Lycaenidae). — *Mitteilungen der entomologischen Gesellschaft Basel* (nf) **5**: 123–130.
- Billi, F., Duteil, M. & Rymarszyk, F. 1999. Un nouveau papillon pour la Côte d'Azur et la Provence: *Cacyreus marshalli* Butler 1898 (Lepidoptera, Lycaenidae). — *Riviera Scientifique* **1999**: 49–52.
- Binon, M. 2005. *Cacyreus marshalli* (Butler, 1898), “la petite bete qui monte”... dans le Loiret (Lepidoptera Lycaenidae). — *Entomologiste* (Paris) **61**(1): 33–34.
- Bonetti, A. (ed.) 2008. [*Zizeeria karsandra* on Milos]. — www.kykladesnews.gr/greece-islands-milos/68-newscategory/50635-2010-01-29%2005-40-17.html [accessed 18 March 2010].
- Casini, P. M. 2003. Presence de *Cacyreus marshalli* (Butler, 1898) à Florence (Italie) et notes sur son élevage. — *Linneana Belgica* **19**(4): 177–178.
- Cernigliaro, A., Di Benedetto, R. & Leotta, R. 2003. Nuovi dati sulla presenza di macrolepidotteri in Sicilia (Lepidoptera). — *Bollettino della Società Entomologica Italiana* **135**(3): 181–187.
- Cervello, A. 1995. Primera cita a Catalunya d'un adult de *Cacyreus marshalli* Butler, 1898 (Lepidoptera, Lycaenidae). — *Butlleti de la Societat Catalana de Lepidopterologia* **75**: 36.
- Contini, C., Mudu C., Pirodda E. & Senis G. 2005. Sulla presenza in Sardegna del Lepidottero Lycaenidae sudafricano *Cacyreus marshalli*, Buttler, 1898. — *2005 Rendiconti Seminario Facoltà Scienze Università Cagliari* **75**: 1–2.
- Cuvelier, S., Degrande, J., Merveillie, L., Spruytte S. & Vervaeke, J. 2009. Opmerkelijke dagvlindersoorten in West-Vlaanderen anno 2008 (Lepidoptera: Lycaenidae). — *Phegea* **37**(4): 147–152.

- Crawforth, A. 1998. An unusual butterfly in Andalucia. — *Bulletin of the Amateur Entomologists' Society* **57**(416): 19–20.
- Dantart, J. 1996. Noves dades sobre la presència de *Cacyreus marshalli* Butler, 1898 (Lepidoptera: Lycaenidae) a la ciutat de Barcelona. — *Butlletí de la Societat Catalana de Lepidopterologia* **76**: 24–26.
- Dapport, L. 2004. Due specie di lepidotteri nuove per l'Arcipelago Toscana: *Cacyreus marshalli* Butler, 1898 e *Aletia languida* (Walker, 1858) (Lycaenidae, Noctuidae). — *Atti della Società Toscana di Scienze Naturali Residente in Pisa Memorie Serie* **B110**: 1–2.
- Dunkin, D. 2005. The geranium bronze in north Portugal. — *Bulletin of the Amateur Entomologists' Society* **64**(459): 58.
- Eeles, P. & Holloway, C. 2010. UK Butterflies – *Cacyreus marshalli*. — www.ukbutterflies.co.uk/species.php?species=marshalli [accessed 10 March 2010].
- Eitschberger, U. & Stamer, P. 1990. *Cacyreus marshalli*, Butler 1898, eine neue Tagfalterart für die europäische Fauna (Lepidoptera, Lycaenidae). — *Atalanta Würzburg* **21**: 101–108.
- Favilli L. & Manganelli, G. 2006. Life history of *Cacyreus marshalli*, a South African species recently introduced into Italy (Lepidoptera Lycaenidae). — *Bollettino della Società Entomologica Italiana* **138**(1): 51–61.
- Fernandez, B. A. 2003. Confirmación de la presencia de *Cacyreus marshalli* Butler, (1898) en Lanzarote (Lepidoptera: Lycaenidae) y comentarios sobre otros ropaloceros de interés. — *Butlletí de la Societat Catalana de Lepidopterologia* **91**: 55–58.
- Fernandez, D., Perez-de-Gregorio, J. J. & Taymans, M. 1998. New data on the distribution of *Cacyreus marshalli* Butler, (1898) in Catalonia (Lepidoptera: Lycaenidae). — *Butlletí de la Societat Catalana de Lepidopterologia* **81**: 25–26.
- Filus, S., Rennwald, E. & Schulte, T. 2001. Der Pelargonien-Bläuling *Cacyreus marshalli* (Lepidoptera: Lycaenidae) erstmals auch in Rheinland-Pfalz beobachtet. — *Fauna und Flora in Rheinland Pfalz* **9**(3): 1025–1028.
- Girod, C. & Sauce, R. 2002. Presence de *Cacyreus marshalli* Butler dans les départements du Rhône et de la Haute-Loire (Lepidoptera Lycaenidae). — *Bulletin Mensuel de la Société Linnéenne de Lyon* **71**(7): 275–276.
- Grey, P. R. 1992. The occurrence of *Cacyreus marshallii* [marshalli] (Lycaenidae) in Menorca. — *Butterfly Conservation* **52**: 8–9.
- Gries, N. 2000. Erstfund von *Cacyreus marshalli* Butler, 1898, in Deutschland. — *Entomologische Zeitschrift* **110**(11): 331.
- Hesselbarth, G., van Oorschot, H. & Wagener, S. 1995. *Die Tagfalter der Türkei*. – Vol. 1: 754 pp. — Selbstverlag Sigbert Wagener, Bocholt, Germany.
- Heylen, F., Bosmans, R. & Van Dyck, H. 2002. Zuidafrikaans blauwtje duikt op in Herenthout. — *Natuur.focus* **1**(4): 164–165.
- Hornemann, A. 2004. Erstnachweis von *Cacyreus marshalli* (Butler, 1898) für die Kanareninsel Fuerteventura (Lepidoptera: Lycaenidae) und weitere Beobachtungen. — *Nachrichten des Entomologischen Vereins Apollo* **25**(1–2): 21–23.
- Kosmač, M., & Verovnik, R. 2009. First record of *Cacyreus marshalli* (Lycaenidae) from the Balkan Peninsula. — *Nota lepidopterologica* **32**(1): 81–82.
- Lalanne-Cassou, B. 1996. New observation of *Cacyreus marshalli* Butler in Spain (Lepidoptera Lycaenidae). — *Alexandor* **19**(5–6): 384.
- Landemaine D. 2002. Observation de *Cacyreus marshalli* Btlr in Corsica (Lepidoptera, Lycaenidae). — *Alexandor* **21**(5): 311.
- Lang, R. 2002. *Cacyreus marshalli* Butler, 1898, nun auch im mittleren Südosten Italiens in den Abruzzen nachgewiesen (Lepidoptera: Lycaenidae). — *Entomologische Zeitschrift* **112**(6): 162–163.
- Latasa-Asso, T. 1993. *Cacyreus marshalli* Butler, ya se ha establecido en la capital Riojana. — *SHILAP, Revista de Lepidopterologia* **21**(83): 199–200.
- Mace, E. 2007. Contribution à la connaissance de la faune lépidoptérologique de la Haute-Normandie. Découverte de *Cacyreus marshalli*; espèce nouvelle pour la Seine-Maritime et la Haute-Normandie. (Lepidoptera Rhopalocera Lycaenidae). — *Bulletin de Liaison de l'Association Entomologique d'Evreux* **56**(2005): 39–44.

- Makris, C. 2003. *Butterflies of Cyprus*. — Bank of Cyprus Cultural Foundation. 331 p.
- Maechler, J. 2000. Nouvelles captures de *Cacyreus marshalli* Btlr., 1897, dans le Var (Lepidoptera Lycaenidae). — *Alexanor* **21**(1–2): 63–64.
- Marney, M. 2002. Colonisation by *Cacyreus marshalli* (Butler) (Lep.: Lycaenidae) of a site in southwest France. — *Entomologist's Record and Journal of Variation* **114**(2): 91–92.
- Maso, A. 1994. *Cacyreus marshalli* Butler, 1898, especie nova per a Catalunya i instal·lació a l'area de Palma de Mallorca. — *Bulleti de la Societat Catalana de Lepidopterologia* **73**: 43.
- Mérit, X. 2003. *Cacyreus marshalli* Butler, 1898, nouvelle espèce pour l'Alsace (Lepidoptera, Lycaenidae). — *Bulletin des Lépidoptéristes de France* **12**(26): 108.
- Mérit, X. & Mérit, V. 2002. *Cacyreus marshalli* (Butler, 1898), espèce nouvelle pour les départements de la Drôme et de la Loire (Lepidoptera Lycaenidae). — *Alexanor* **22**(7): 415–416.
- Myncke, G. 1991. *Cacyreus marshalli* Butler, 1898 on Mallorca (Lepidoptera: Lycaenidae). — *Phegea* **19**(4): 131.
- Oliver-Sanz, F. 2000. Records of *Cacyreus marshalli* Butler from Cantabria. — *Saturnia* **9**(15): 47.
- Ortiz-García, M. 1995. *Cacyreus marshalli* Butler, (1898) en Guadalajara. — *SHILAP, Revista de Lepidopterologia* **23**(91): 347.
- Pamperis, L. 1997. *Butterflies of Greece*. — Bastas-Plessas, Athens. 574 pp.
- Pamperis, L. 2009a. *The butterflies of Greece*. — www.pamperis.gr/the_butterflies_of_greece/nees_anaphores_new_records.html
- Pamperis, L. 2009b. *Butterflies of Greece* (Second edition). — Pamperis, Athens. 766pp.
- Pasquid, G. 2000. First confirmed record of *Cacyreus marshalli* Butler 1897 in Gironde (Lepidoptera, Lycaenidae). — *Bulletin de la Société Linnéenne de Bordeaux* **28**(2): 97–98.
- Polak, S. 2009. Geranium Bronze (*Cacyreus marshalli* (Butler, 1898)): A new butterfly species for the Slovenian fauna. — *2nd Slovenian Entomological Symposium, Ljubljana*, 7–8 Febr. 2009: 104–105.
- Quivron, D. 2000. *Cacyreus marshalli* Btlr en Haute-Provence (Lepidoptera Lycaenidae). — *Alexanor* **21**(1–2): 79–80.
- Raynor, E. M. 1990. The occurrence of a *Cacyreus* species (Lep.: Lycaenidae) in Majorca. — *Entomologist's Record and Journal of Variation* **102**: 250.
- Redondo, V. M. & Murria, E. 1993. Presencia de *Cacyreus marshalli* Butler, 1898 en Aragón (Lep. Lycaenidae). — *Zapateri* **3**: 61–66.
- Reid, J. 1998. The discovery of *Cacyreus marshalli* (Butler, 1898) (Lepidoptera: Lycaenidae) in France. — *Entomologist's Gazette* **49**(4): 253–256.
- Reinhardt, R. 1999. Further localities of *Cacyreus marshalli* (Butler, 1898) in Andalucia on the Spanish mainland (Lepidoptera, Lycaenidae). — *Atalanta, Marktleuthen* **30**(1–4): 153–154.
- Russo, L. 2003. *Cacyreus marshalli* (Butler, 1898) en Pouille et Campanie (Italie meridionale) (Lepidoptera: Lycaenidae). — *Linneana Belgica* **19**(4): 193–194.
- Ryrholm, N. 2007. Blavingen *Cacyreus marshalli* tillfalligt etablerad i sodra Gastrikland. — *Fauna och Flora Stockholm* **102**(1): 12–13.
- Sammut, P. 2007. *Cacyreus marshalli* Butler, 1898 reaches the Maltese islands (Lepidoptera Lycaenidae). — *SHILAP, Revista de lepidopterologia* **35**(139): 317–319.
- Sarto i Monteys, V. 1992. Spread of the Southern African Lycaenid butterfly, *Cacyreus marshalli* Butler, 1898 (Lep: Lycaenidae) in the Balearic Archipelago (Spain) and considerations on its likely introduction to continental Europe. — *Journal of Research on the Lepidoptera* **31**(1–2): 24–34.
- Savina, H. 2001. Présence de *Cacyreus marshalli* en Haute-Garonne et Pyrénées-Atlantiques (Lepidoptera Lycaenidae). — *Insectes* **121**: 32.
- Shaw, M. R. 2001. *Cacyreus marshalli* (Butler) (Lep.: Lycaenidae) in Corsica. — *Entomologist's Record and Journal of Variation* **113**(6): 262.
- Stefanescu, C. 1996. Confirmation of the continuous biological cycle of *Cacyreus marshalli* Butler, 1898 (Lepidoptera: Lycaenidae) in the city of Barcelona. — *Bulleti de la Societat Catalana de Lepidopterologia* **77**: 25–26.
- Suarez-Fernandez, A. L. 2003. Registro de *Cacyreus marshalli* Butler, 1898 en Asturias (Lepidoptera: Lycaenidae). — *Boletín de la SEA* **32**: 215.

- Tarrier, M. 1998. *Cacyreus marshalli* Butler, 1898, a new species for France, Portugal and Morocco (Lepidoptera Lycaenidae). — *Alexanor* **20**(2–3): 143–144.
- Tennent, W. J., Hall, D. & Russell, P. J. C. 2004. Some notes on the butterflies of Fuerteventura (Spain, Canary Islands). — *Entomologist's Gazette* **55**(4): 227–232.
- Thiele, J. H. R. & Nassig, W. A. 2000. Record of the pelargonium blue (*Cacyreus marshalli* Butler, 1898) in Germany (Lepidoptera, Lycaenidae, Polyommatainae). — *Nachrichten des Entomologischen Vereins Apollo* **20**(3–4): 290.
- Tolman, T. & Lewington, R. 1997. *Butterflies of Britain and Europe*. — Collins, London. 320 pp.
- Torres-Villa, L. M. & Bielza, P. 1997. The geranium pest *Cacyreus marshalli* Butler, 1898 (Lepidoptera: Lycaenidae) in Toledo. — *SHILAP, Revista de Lepidopterologia* **25**(97): 62.
- Trematerra, P., Zilli A, Valentini, V. & Mazzei, P. 1997. *Cacyreus marshalli*, un lepidottero sudafricano dannoso ai gerani in Italia. — *Informatore Fitopatologico* **7–8**: 2–6.
- Troukens, W. 1991. *Cacyreus marshalli* found in Belgium. — *Phegea* **19**(4): 129–131.
- Tropinao, F. G. 2003. *Cacyreus marshalli* Butler (Lepidoptera: Lycaenidae) su gerani in Campania. — *Bolletino del Laboratorio di Entomologia Agraria Filippo Silvestri* **58**: 145–147.
- Wakeham-Dawson, A. & Aguiar, A. M. F. 2003. The arrival of a *Cacyreus marshalli* (Butler, 1898) larva, a larval host-plant for *Lycaena phlaeas phlaeoides* (Staudinger, 1901) and notes on other butterfly species in the Madeiran Archipelago, Portugal, 8–15 July 2002 (Lepidoptera: Rhopalocera). — *Entomologist's Gazette* **54**(4): 227–231.
- White, M. J. 1998. Geranium bronze *Cacyreus marshalli* Butler (Lep.: Lycaenidae) in the Algarve, Portugal. — *Entomologist's Record and Journal of Variation* **110**(11–12): 297.
- White, M. J. 2004. Geranium bronze *Cacyreus marshalli* Butler (Lep.: Lycaenidae) on the Riviera. — *Entomologist's Record and Journal of Variation* **116**(1): 43.
-